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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|-------------------------|---------------------|------------------|
| 10/816,697 | 04/05/2004 | Richard Scott Bourgeois | 126533-1 | 9731 |

6147 7590 03/22/2007
GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH
PATENT DOCKET RM. BLDG. K1-4A59
NISKAYUNA, NY 12309

| EXAMINER |
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CHUO, TONY SHENG HSIANG

| ART UNIT | PAPER NUMBER |
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1745

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
|--|------------|---------------|
| 3 MONTHS | 03/22/2007 | PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/816,697

Applicant(s)

BOURGEOIS ET AL.

Examiner

Tony Chuo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 December 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) 1-18 and 27-29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 19-26 and 30-37 is/are rejected.
- 7) ☒ Claim(s) 34-37 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. Claims 1-37 are currently pending. Claims 1-18 and 27-29 are withdrawn from further consideration as being drawn to a non-elected invention. New claims 30-37 have been added. The objection to the drawings is withdrawn. The objection to the specification is withdrawn. The 112 rejections of claims 19 and 26 are withdrawn. The amended claims do overcome the previously stated 102 and 103 rejections. However, upon further consideration, claims 19-26 and 30-37 are rejected under the following new 112 and 103 rejections. This action is made FINAL as necessitated by the amendment.

Claim Objections

2. Claims 34-37 are objected to because of the following informalities: The sentences "a portion of said wall immediately adjacent to said fuel cell and said sealed passage are configured ..." and "a portion of said wall immediately adjacent to said fuel cell and said sealed passage are made ..." are grammatically incorrect. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 19-26 and 31-37 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter

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which applicant regards as the invention. It is unclear whether the phrase "said wall" is referring to the top wall, bottom wall, or both top and bottom walls. For purpose of compact prosecution, the phrase "said wall" is interpreted as "said bottom wall".

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 19-26 and 30-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barnett et al (US 5770327) in view of Hartvigsen et al (US 6265095). The Barnett reference discloses a solid oxide fuel cell stack comprising a plurality of unit fuel cells "13" and a plurality of interconnects "12" that form a plurality of fuel cell assemblies that are electrically connected together such that at least one sealed passage "26" extends between the plurality of fuel cell assemblies, wherein each fuel cell assembly comprises: a hollow manifold comprising an upper sheet "16" and lower sheet "18" that extend between a first end and a second end and comprises openings "29","31","32" extending there through in flow communication with the hollow manifold; and a fuel cell comprising an anode "36", a cathode "38", and an electrolyte "37" disposed there between with the fuel cell disposed on the lower sheet "18" (See column 2, lines 21-55 and Figures 3 and 4). It also discloses a cathode flow channel "22" coupled to the hollow manifold of first fuel cell assembly and second fuel cell assembly,

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wherein the cathode flow channel is configured for directing an oxidant between the first fuel cell assembly and the second fuel cell assembly (See column 2, lines 59-63 and Figure 5). It also discloses a hollow manifold for the first fuel cell assembly and the second fuel cell assembly that is substantially rectangular (See column 3, line 13 and Figure 4). It also discloses interconnects "12" that consists of metal sheets which are electrically conductive materials (See column 2, lines 23-25). It also discloses a fuel cell stack that comprises materials of different thermal coefficients of expansion such as ceramic electrodes of the fuel cell and metallic interconnects. It also discloses a lower sheet "18" of the hollow manifold that acts as an anode interconnect (See Figure 4).

However, Barnett et al does not expressly teach a portion of the top wall and bottom wall immediately adjacent to the fuel cell and the sealed passage that are configured to have lower stiffness compared to at least one of the fuel cell and the sealed passage to accommodate a strain between the fuel cell, top and bottom walls, and the sealed passage wherein the strain is developed due to thermal expansion; a portion of the wall immediately adjacent to the fuel cell and the sealed passage that are configured to have compliant structure to accommodate a difference in strain between the fuel cell, the wall, and the sealed passage; a portion of the wall immediately adjacent to the fuel cell and the sealed passage that are configured to have corrugated structure to accommodate a difference in strain between the fuel cell, the wall, and the sealed passage; or a portion of the wall immediately adjacent to the fuel cell and the sealed passage that are made by stamping to accommodate a difference in strain between the fuel cell, the wall, and the sealed passage.

The Hartvigsen reference discloses an interconnect for solid oxide fuel cells comprising a first compliant sheet of material "70" and a second compliant sheet of material "72" that are configured to accommodate a difference a strain between the fuel cell and the compliant sheets wherein the CTE of the interconnect does not match the CTE of the fuel cell (See column 3, lines 33-34, column 3, lines 46-50, and column 4, lines 26-28). It also discloses compliant sheets that comprise corrugated sheets (See column 3, lines 49-50). Examiner's note: It is inherent that the first and second compliant sheets have lower stiffness compared to the fuel cell. Since the entire compliant sheet "70" is corrugated as shown in figures 2 and 3, a corrugated portion will always be immediately adjacent to the fuel cell and sealed passage.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Barnett fuel cell stack to include a portion of the top wall and bottom wall immediately adjacent to the fuel cell and the sealed passage that are configured to have lower stiffness compared to at least one of the fuel cell and the sealed passage to accommodate a strain between the fuel cell, top and bottom walls, and the sealed passage wherein the strain is developed due to thermal expansion; a portion of the wall immediately adjacent to the fuel cell and the sealed passage that are configured to have compliant structure to accommodate a difference in strain between the fuel cell, the wall, and the sealed passage; a portion of the wall immediately adjacent to the fuel cell and the sealed passage that are configured to have corrugated structure to accommodate a difference in strain between the fuel cell, the wall, and the sealed passage; or a portion of the wall immediately adjacent to the fuel

cell and the sealed passage that are made by stamping to accommodate a difference in strain between the fuel cell, the wall, and the sealed passage in order to be able to utilize high performance materials for interconnects that do not match the coefficient of thermal expansion of the fuel cell, but do maintain the mechanical integrity of the fuel cell stack.

Examiner's note: Claim 37 is being construed as product-by-process claim and that the product itself does not depend on the process of making it. Accordingly, in a product-by-process claim, the patentability of a product does not depend on its method of production (Refer to MPEP 2113: Product-by-Process Claims).

Response to Arguments

7. Applicant's arguments with respect to claims 19-26 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Chuo whose telephone number is (571) 272-0717. The examiner can normally be reached on M-F, 8:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TC


JONATHAN CREPEAU
PRIMARY EXAMINER